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June 16, 2017

Lynda Deschambault
Remedial Project Manager, Superfund Division
U.S. Environmental Protection Agency, Region 9
75 Hawthorne Street, 10th Floor (SFD 7-1)
San Francisco, California 94105

Subject: **Response to U.S. EPA Comments Dated May 18, 2017, on Groundwater Technical Data Summary Report Version No. 2**
Leviathan Mine Site
Alpine County, California

Dear Ms. Deschambault:

Atlantic Richfield Company (Atlantic Richfield) has received the U.S. Environmental Protection Agency's (U.S. EPA's) letter dated May 18, 2017, which provides comments on the *Groundwater Technical Data Summary Report* [Groundwater TDSR], *Version No.2, Leviathan Mine Site, Alpine County, California,* dated January 25, 2017 (Version No. 2) and Atlantic Richfield's November 4, 2016 response to U.S. EPA comments on a previous version dated March 21, 2016. In addition, the Lahontan Regional Water Quality Control Board (LRWQCB) submitted comments on Version No. 2 on March 1, 2017. The Groundwater TDSR was submitted in partial fulfillment of the requirements of the Statement of Work attached to the *Administrative Order for Remedial Investigation and Feasibility Study, Comprehensive Environmental Response, Compensation, and Liability Act Docket No. 2008-18* issued by the U.S. EPA on June 23, 2008.

The U.S. EPA's May 18, 2017 letter requested that Atlantic Richfield provide a response within 30 days stating that Atlantic Richfield concurs with the comments and will address them as requested or identify any comments that Atlantic Richfield disagrees with, does not concur with, or will not incorporate into the next version of the Groundwater TDSR. Atlantic Richfield notes that a number of the U.S. EPA comments were previously addressed, but we believe that further clarification to our previous responses is necessary to eliminate unnecessary report revisions or data analyses that are unnecessary. We believe that the outstanding issues related to the characterization of groundwater at the Leviathan Mine Site (site) can be addressed in the final version of the Groundwater TDSR to be submitted in December 2017 as an appendix to the draft Site Characterization Report. Atlantic Richfield's June 19, 2017 letter regarding the RI/FS Schedule provides our justification for submitting the next revised version of the Groundwater TDSR at that time (rather than by June 30, 2017 as requested in the comment letter).

Our clarifications of outstanding issues fall into the following general categories, which both the U.S. EPA and/or the LRWQCB mention in one or more of their comments:

1. Comments about the limited analysis of historical data.
2. Comments about the evaluation of groundwater chemistry along groundwater flow paths.
3. Comments about the about the historical influence of pit dewatering.
4. Comments about the Data Quality Assessment.

Selected specific comments are addressed following the discussion of the general categories.

GENERAL CATEGORIES

1. **Comments about limited analysis of historical data.** The U.S. EPA is satisfied with the inclusion and analysis of available historic groundwater elevation data but suggests that existing historical piezometric and analytical data are not adequately assessed for comparability with RI data or used to assess site aspects such as temporal trends, chemical fate and transport, or assessment of current and potential threats. Several new figures introduced in Section 7.0 of Version No. 2 address comparability and analysis of historical analytical data. Appendix 7A presents a graphical analysis of the comparability of historical and remedial investigation (RI) data for key remedial investigation/feasibility study (RI/FS) metals at this site. In addition, Appendix 7C includes contoured chemical distribution maps of key RI/FS metals, including data from shallow and deep USGS piezometers sampled in 1982 as well as analytical data collected in 1998 from existing monitoring wells in the Leviathan Creek Study Area.

   Atlantic Richfield will consider selected additions of historical data to the current graphical presentation of data, including addition of the 1982 data to the Appendix 7A plots evaluating comparability to RI data, adding analytical data from 1998 to selected time concentration plots in Appendix 7B, and adding data from 1982 to selected Stiff diagram timeline plots illustrated in Figures 7-14 through 7-16. Atlantic Richfield will not, however, include the historical data in more rigorous quantitative analyses (for example, statistical calculations used to determine risk analysis for the reasons stated in Section 7.2 of the report) because of the lack of historical data validation and verification following the processes established in the site *Remedial Investigation/Feasibility Study Quality Assurance Project Plan, Revision No. 2, Leviathan Mine Site, Alpine County, California* (RI/FS QAPP). The historical data cannot be evaluated using the RI/FS QAPP processes for RI-data because those data were collected by third parties that did not collect data in accordance with the RI/FS QAPP. However, the historical data were assessed per the RI/FS QAPP processes applicable to non-direct measurement (non-RI) data.

   In addition, Atlantic Richfield reiterates that the RI/FS evaluation will be focused on current conditions per National Contingency Plan and U.S. EPA guidance. The graphical presentation of historical analytical data from prior investigations described above

provides adequate context for the RI and potentially supports the evaluation of data trends, but detailed quantitative analysis of historical data, particularly data that are not representative of current conditions, is not considered necessary and could lead to a misinterpretation of the historical data and/or the development of unsupported conclusions based on historical data.

2. **Comments about the evaluation of groundwater chemistry along groundwater flow paths.** Atlantic Richfield added evaluations of groundwater flow paths from source areas to acidic-discharge locations and associated changes in chemical characteristics to the current version of the Groundwater TDSR per the U.S. EPA's previous comments. The U.S. EPA now states that the evaluations are overly simplified and may lead to misinterpretation of groundwater conditions at the site. The U.S. EPA further suggests specific modifications to the wells used in the analysis or other modifications to specific figures.

   In response to these comments, Atlantic Richfield will consider adding plan view diagrams using updated 2016 potentiometric data to improve illustration of potential flow paths to discharge locations and support rationale for specific wells used in a flow path analysis. However, Atlantic Richfield does not intend to prepare a significantly expanded evaluation or description of chemical evolution of groundwater chemistry along flow paths because we believe it is not critical to completing the RI/FS and, given the complexity of the conceptual understanding of the hydrogeology at this site, could lead to misinterpretation of the available data. Regardless of which source or various sources that are grouped for evaluation and that may contribute flow to an acid discharge location, the fundamental geochemical evolution along that flow path – decrease in pH, increase in the sulfate anion relative to bicarbonate, and increase in total dissolved solids and dissolved metals concentrations – will remain consistent. While the magnitude of these changes may vary, these variations will not substantively change the remedy for groundwater at the site. As a result, the sources of acid discharges at the site (i.e., mine waste or in-situ mineralized bedrock) and mechanisms of acidification of groundwater at the site are considered sufficiently characterized and understood for the purposes of the completion of the RI/FS.

3. **Comments about the about the historical influence of pit dewatering.** Several comments dispute the description and presentation of the magnitude and extent of dewatering in the Pit Study Area (PSA) as a result of the former underground workings and excavation of the Pit. The U.S. EPA has previously requested several revisions to the report that could potentially exaggerate the magnitude and extent of the decline in water levels from pre-mining conditions. As stated in Atlantic Richfield's November 4, 2016 response to U.S. EPA comments, future revisions to the report will be revised to describe the uncertainties in pre-mining water-level conditions, but the document will not be revised to include more quantitative estimates of the range in groundwater reductions because such estimates would be speculative and unsupported because of the lack of

direct measurements of pre-mining groundwater levels.

In addition, Atlantic Richfield is unable to add Tunnel 4 to the cross section on Figure 3-2 because we cannot identify any plan or cross sectional view maps or diagrams showing where Tunnel 4 is located; thus, we do not know if or where Tunnel 4 would intersect the plane of the cross section. Atlantic Richfield also objects to the omission of references to the anecdotal accounts of low flow from Tunnel 4 because it provides important information regarding observation(s) of large differences in groundwater flow over relatively short distances and time from discrete volumes of rock in the vicinity of the underground workings. This information further supports the degree of uncertainty in the anecdotal evidence and evaluations based upon the historical accounts and further demonstrates the significant uncertainties associated with pre-mining water-level conditions.

4. **Comments about the Data Quality Assessment.** The U.S EPA states that the Data Quality Assessment (DQA) is not fully integrated into the Groundwater TDSR and that it is unsure whether the DQA was performed adequately. The DQA process being performed involves the following 5 steps as outlined in U.S. EPA guidance for data quality assessments :

   Step 1: Review the DQOs and sampling design

   Step 2: Confirm data review results to evaluate the data quality

   Step 3: Select statistical test(s), as appropriate, to evaluate data usability.

   Step 4: Verify assumptions.

   Step 5: Draw conclusions about the quality and usability of the data (data report will state conclusions regarding the data quality and usability of the results.

   At the time this version of the Groundwater TDSR was completed, Atlantic Richfield did not have data from reference groundwater wells; therefore the statistical analyses and hypothesis testing required for Steps 3 through 5 could not be completed. Steps 1 and 2 were completed and documented. The statistical testing will be initiated to test the null hypotheses specified in the DQOs, which requires comparison of data collected from locations potentially affected by mining operations to data collected from areas unaffected by mining (i.e. reference areas) and/or human health and ecological screening criteria. In addition, statistical analyses will be performed for calculation of reference threshold values (RTVs). Evaluation of these statistical tests and analyses are applicable to Steps 3 through 5, and these steps will be documented in the next version of the Groundwater TDSR to be submitted in December 2017 as an appendix to the Draft Site Characterization Report. The other media-specific TDSRs currently being prepared for submittal with the Draft Site Characterization Report will also include a summary of all five steps in the DQA process.

SELECT SPECIFIC COMMENTS

In addition to the four categories of general comments described above, the U.S. EPA's May 18, 2017 comment letter requested that the Groundwater TDSR include a statement that an annual groundwater update will be prepared. Consistent with the Administrative Order, Atlantic Richfield will provide annual database updates that will include future groundwater monitoring data. The U.S. EPA's May 18, 2017 comment letter also noted that field sampling SOPs were not included in the RIFS QAPP but are contained in a number of various workplans. As a result, the U.S. EPA directed Atlantic Richfield to provide one centralized sitewide RI/FS Sampling and Analysis Plan (SAP) "appendix" containing all field sampling plans and associated sampling SOPs. Atlantic Richfield objects to the preparation of the requested SAP appendix because it serves no meaningful purpose given that the implementation of sampling and analysis activities are largely complete and the development and maintenance of a centralized SAP would be an administrative burden. As an alternative, Atlantic Richfield will post a compilation of the SOPs to the project SharePoint site to allow access by the U.S. EPA and other project stakeholders.

If you have any questions or comments, please feel free to contact me at (657) 529-4537 or anthony.brown@bp.com.

Sincerely,

Anthony R. Brown
Project Manager, Mining

cc: Gary Riley, U.S. Environmental Protection Agency, Region 9 – via electronic copy
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